

## SECTION 09311 - CERAMIC TILE

### PART 1 - GENERAL

#### 1.1 SUMMARY (Not Applicable)

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include tile locations and patterns. Include details and locations of contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples: At least 12-inch- (300-mm-) square Sample of each type, color, and texture of tile and grout combination required, mounted on braced cementitious backer units, and with joints grouted.

#### 1.3 QUALITY ASSURANCE

- A. Mockups: Install mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
  - 1. Install mockups as shown on Drawings.
  - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.4 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: Full-size units equal to 3 percent of amount installed for each type, color, texture, and size indicated.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Product: Subject to compliance with requirements, provide the product specified.

## 2.2 FLOOR TILE

### A. Unglazed Ceramic Mosaic Tile:

1. Products:
  - a. American Olean Tile Company; .
  - b. Buchtal Corporation USA; .
  - c. Dal-Tile Corporation; .
  - d. Lonestar Ceramics Company; .
  - e. Mannington Ceramic Tile; .
  - f. Metropolitan Ceramics; .
  - g. Seneca Tiles, Inc.; .
2. Mounting: Factory back-mounted.
3. Composition: Porcelain or Porcelain with abrasive admixture or Impervious natural clay or Vitreous natural clay or Impervious natural clay with abrasive admixture or Vitreous natural clay with abrasive admixture or Conductive.
4. Module Size: 1 by 1 inch (25.4 by 25.4 mm) or 1 by 2 inches (25.4 by 50.8 mm) or 2 by 2 inches (50.8 by 50.8 mm).
5. Nominal Thickness: 1/4 inch (6.35 mm).
6. Face: Plain with cushion edges or Pattern of design indicated, with cushion edges.
7. Color: As selected from manufacturer's full range

### B. Glazed Ceramic Mosaic Tile:

1. Products:
  - a. American Olean Tile Company; .
  - b. Buchtal Corporation USA; .
  - c. Dal-Tile Corporation; .
  - d. Seneca Tiles, Inc.; .
  - e. Summitville Tiles, Inc.; .
2. Mounting: Factory back-mounted.
3. Composition: Porcelain or Impervious natural clay or Vitreous natural clay.
4. Module Size: 1 by 1 inch (25.4 by 25.4 mm) or 1 by 2 inches (25.4 by 50.8 mm) or 2 by 2 inches (50.8 by 50.8 mm).
5. Thickness: 1/4 inch (6.35 mm).

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6. Face: Plain with cushion edges or Pattern of design indicated, with cushion edges.
7. Color: As selected from manufacturer's full range.

C. Unglazed Quarry Tile:

1. Products:
  - a. American Olean Tile Company; .
  - b. Buchtal Corporation USA; .
  - c. Dal-Tile Corporation; .
  - d. Metropolitan Ceramics; .
  - e. Quarry Tile Company; .
  - f. Seneca Tiles, Inc.; .
  - g. Summitville Tiles, Inc.; .
2. Wearing Surface: Nonabrasive or Abrasive aggregate embedded in surface.
3. Nominal Tile Size: 3 by 3 inches (76 by 76 mm) or 4 by 4 inches (102 by 102 mm) 6 by 3 inches (152 by 76 mm) or 6 by 6 inches (152 by 152 mm) or 8 by 3-7/8 inches (203 by 98 mm) or 7-5/8 by 7-5/8 inches (194 by 194 mm) or 8 by 8 inches (203 by 203 mm) or 160 by 320 mm or 140 by 280 mm or 300 by 300 mm.
4. Thickness: 3/8 inch (9.5 mm) or 1/2 inch (12.7 mm) or 3/4 inch (19 mm).
5. Face: Plain with square edges or Pattern of design indicated with square edges.
6. Color: As selected from manufacturer's full range
7. Temporary Protective Coating: For tile grouted with furan, factory or field applied, compatible with tile and setting and grouting materials, easily removable after grouting, and as follows:
  - a. Petroleum Paraffin Wax: Fully refined and odorless, containing at least 0.5 percent oil and with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
  - b. Grout Release: Approved for use indicated by tile and setting and grouting materials manufacturers.

D. Glazed Quarry Tile:

1. Products:
  - a. Buchtal Corporation USA; .
  - b. Quarry Tile Company; .
  - c. Seneca Tiles, Inc.; .
2. Wearing Surface: Nonabrasive or Abrasive aggregate embedded in surface.
3. Nominal Tile Size: 3 by 3 inches (76 by 76 mm) or 4 by 4 inches (102 by 102 mm) or 6 by 3 inches (152 by 76 mm) or 6 by 6 inches (152 by 152 mm) or 8 by 3-7/8 inches (203 by 98 mm) or 8 by 8 inches (203 by 203 mm).
4. Thickness: 3/8 inch (9.5 mm) or 1/2 inch (12.7 mm) or 3/4 inch (19 mm).

5. Face: Plain with square edges or Pattern of design indicated with square edges or As indicated.
6. Color: As selected from manufacturer's full range .

E. Trim Units: Matching flat tile

1. Size: Coordinated with size of flat tile
2. Shapes:
  - a. Base: Coved or Straight.

F. Setting Materials:

1. Portland Cement Mortar: ANSI A108.1A, for wet-set installation ANSI A108.1B, for cured mortar bed installation or ANSI A108.1C for wet or cured mortar bed installation.
2. Thin-Set Mortar: ANSI A118.1 nonsagging, dry-set portland cement ANSI A118.4, latex portland cement.
3. Chemical-Resistant Mortar: ANSI A118.3, chemical-resistant, water-cleanable setting and grouting epoxy or ANSI A118.8, furan.
4. Setting Adhesive: ANSI A136.1, Type I, organic or ANSI A118.3, water-cleanable epoxy.

G. Grout Materials:

1. Grout for Joints 1/8 Inch (3.2 mm) and Narrower: ANSI A118.6, dry set unsanded latex-portland cement.
  - a. Color: As selected from manufacturer's full range
2. Grout for Joints Wider Than 1/8 Inch (3.2 mm): ANSI A118.6, commercial portland cement or sanded latex-portland cement.
  - a. Color: As selected from manufacturer's full range.
3. Chemical-Resistant Grout: ANSI A118.3, chemical-resistant, water-cleanable setting and grouting epoxy or ANSI A118.5, furan.
  - a. Color: As selected from manufacturer's full range

## 2.3 CERAMIC WALL TILE

A. Unglazed Ceramic Mosaic Tile:

1. Products:
  - a. American Olean Tile Company; .
  - b. Buchtal Corporation USA; .

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- c. Dal-Tile Corporation; .
  - d. Lonestar Ceramics Company; .
  - e. Mannington Ceramic Tile; .
  - f. Metropolitan Ceramics; .
  - g. Seneca Tiles, Inc.; .
- 2. Mounting: Factory back-mounted.
  - 3. Composition: Porcelain or Porcelain with abrasive admixture or Impervious natural clay or Vitreous natural clay or Impervious natural clay with abrasive admixture or Vitreous natural clay with abrasive admixture or Conductive.
  - 4. Module Size: 1 by 1 inch (25.4 by 25.4 mm) or 1 by 2 inches (25.4 by 50.8 mm) 2 by 2 inches (50.8 by 50.8 mm).
  - 5. Nominal Thickness: 1/4 inch (6.35 mm).
  - 6. Face: Plain with cushion edges or Pattern of design indicated, with cushion edges.
  - 7. Color: As selected from manufacturer's full range

B. Glazed Ceramic Mosaic Tile:

- 1. Products:
  - a. American Olean Tile Company; .
  - b. Buchtal Corporation USA; .
  - c. Dal-Tile Corporation; .
  - d. Seneca Tiles, Inc.; .
  - e. Summitville Tiles, Inc.; .
- 2. Mounting: Factory back-mounted.
- 3. Composition: Porcelain or Impervious natural clay or Vitreous natural clay.
- 4. Module Size: 1 by 1 inch (25.4 by 25.4 mm) or 1 by 2 inches (25.4 by 50.8 mm) 2 by 2 inches (50.8 by 50.8 mm).
- 5. Thickness: 1/4 inch (6.35 mm).
- 6. Face: Plain with cushion edges or Pattern of design indicated, with cushion edges.
- 7. Color: As selected from manufacturer's full range

C. Glazed Wall Tile:

- 1. Products:
  - a. American Marrazzi Tile, Inc.; .
  - b. American Olean Tile Company; .
  - c. Buchtal Corporation USA; .
  - d. Cerim-Floor Gres Ceramiche; .
  - e. Dal-Tile Corporation; .
  - f. Florida Tile Industries, Inc.; .
  - g. Interceramics, USA; .

- h. KPT, Inc.; .
  - i. Laufen International, Inc.; .
  - j. Mannington Ceramic Tile; .
  - k. Monarch Tile, Inc.; .
  - l. United States Ceramic Tile Company; .
- 2. Mounting: Unmounted or Factory back-mounted or PregROUTED sheets of tiles grouted with silicone rubber complying with ANSI A118.6.
  - 3. Module Size: 4-1/4 by 4-1/4 inches (108 by 108 mm) 6 by 4-1/4 inches (152 by 108 mm) 6 by 6 inches (152 by 152 mm) or 200 by 200 mm or 250 by 250 mm or 200 by 300 mm.
  - 4. Thickness: 5/16 inch (8 mm).
  - 5. Face: Plain with modified square edges or cushion edges or Plain with modified square edges or Plain with cushion edges or Pattern of design indicated, with manufacturer's standard edges.
  - 6. Color: As selected from manufacturer's full range.
- D. Trim Units: Matching flat tile
- 1. Size: Coordinated with size of flat tile
  - 2. Shapes:
    - a. Wainscot Cap: Bullnose or Surface bullnose.
    - b. External Corners: Bullnose or Surface bullnose.
- E. Setting Materials:
- 1. Portland Cement Mortar: ANSI A108.1A, for wet-set installation ANSI A108.1B, for cured mortar bed installation or ANSI A108.1C for wet or cured mortar bed installation.
  - 2. Thin-Set Mortar: ANSI A118.1, nonsagging, dry-set portland cement or ANSI A118.4, latex portland cement.
  - 3. Setting Adhesive: ANSI A136.1, Type I, organic.
- F. Grout Materials:
- 1. Grout for Joints 1/8 Inch (3.2 mm) and Narrower: ANSI A118.6, dry set or unsanded latex-portland cement.
    - a. Color: As selected from manufacturer's full range
  - 2. Grout for Joints Wider Than 1/8 Inch (3.2 mm): ANSI A118.6, commercial portland cement or sanded latex-portland cement.
    - a. Color: As selected from manufacturer's full range
  - 3. Grout for PregROUTED-Tile Sheets: Same silicone rubber used to pregrout sheets.

## 2.4 ACCESSORY MATERIALS

- A. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15), or polyethylene sheeting ASTM D 4397, 4.0 mils (0.1 mm) thick.
- B. Mortar Bed Reinforcing: Galvanized, welded wire fabric, 2 by 2 inches (50.8 by 50.8 mm) by 0.0162-inch (1.57-mm) diameter; comply with ASTM A 185 and ASTM A 82, except for minimum wire size.
- C. Expanded Metal Lath:
  - 1. Interior Applications: Uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel painted after fabrication into lath.
  - 2. Exterior Applications: Zinc-coated (galvanized) steel sheet.
  - 3. Configuration: Flat, over studs and furring or Self-furring, over solid surfaces.
  - 4. Weight: 2.5 lb/sq. yd. (1.4 kg/sq. m) or 3.4 lb/sq. yd. (1.8 kg/sq. m).
- D. Waterproofing for Interior Thin-Set Applications: ANSI A118.10.
  - 1. Polyethylene Sheet:
    - a. Product: Noble Company (The); Nobleseal.
  - 2. PVC Sheet:
    - a. Product: Composite Corporation; Composeal.
  - 3. Latex Rubber:
    - a. Products:
      - 1) Custom Building Products; Trowel & Seal Waterproof Membrane.
      - 2) Laticrete International, Inc.; Laticrete 9235 Waterproof Membrane.
      - 3) Summitville Tiles, Inc.; S-9000.
  - 4. Acrylic Latex:
    - a. Product: Mapei Corporation; PRP 315.
  - 5. Urethane Waterproofing and Tile-Setting Adhesive:
    - a. Products:
      - 1) Bostik; Hydroment Ultra-Set.
      - 2) Southern Grouts & Mortars, Inc.; Deck-Seal 1000.
- E. Stone Thresholds: Uniform in color and finish, fabricated to produce transition from tile surfaces to adjoining surfaces and to be not more than 1/2 inch (12.7 mm) above an adjacent floor finish with transition edges beveled on a slope of not greater than 1:2.

1. Material: Marble, complying with ASTM C 503 requirements for exterior use and with minimum abrasive hardness value of 10 per ASTM C 241
  2. Color and Finish: As selected from manufacturer's full range <Insert color and finish>.
- F. Elastomeric Sealants: ASTM C 920.
1. Non-Traffic Surfaces: One-part, mildew-resistant silicone, Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to substrate, O; with fungicide.
    - a. Products:
      - 1) Dow Corning Corporation; Dow Corning 786.
      - 2) GE Silicones; Sanitary 1700.
      - 3) Pecora Corp.; Pecora 898 Sanitary Silicone Sealant.
      - 4) Rhone-Poulenc, Inc.; Rhodorsil 6B White.
      - 5) Tremco, Inc.; Tremsil 600 White.
  2. Traffic Surfaces: Multipart, pourable urethane, Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to substrate, O.
    - a. Products:
      - 1) Bostik; Chem-Calk 550.
      - 2) Mameco International, Inc.; Vulkem 245.
      - 3) Pecora Corp.; NR-200 Urexpan.
      - 4) Tremco, Inc.; THC-900.
  3. Chemical-Resistant Floor Sealants: Compatible with and having equivalent chemical-resistance properties to tile setting and grouting materials indicated and approved for use indicated by sealant and tile setting and grouting materials manufacturers.
  4. Colors: Match color of grout in adjacent tile.
- G. Cementitious Backer Units: ANSI A 118.9, in maximum lengths and widths available to minimize joints.
1. Thickness: 1/2 inch (12.7 mm).
  2. Products:
    - a. Custom Building Products; Wonderboard.
    - b. Domtar Gypsum; DomCrete Cementitious Tile-Backer Board.
    - c. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
    - d. United States Gypsum Co.; DUROCK Cement Board.
- H. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement based formulation approved by manufacturer of tile setting materials.



- I. Metal Edge Strips: White-zinc-alloy terrazzo strips, 1/8 inch (3.2 mm) wide at top edge with integral provision for anchorage to mortar bed or substrate.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Installation Methods: Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA designations indicated.
- B. Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" applicable to installation methods and setting and grouting materials indicated.
- C. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by ANSI A108 Series tile installation standards for installations indicated.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Apply trowelable leveling and patching compounds to fill cracks, holes, and depressions in substrates.
- E. Remove substrate protrusions, bumps, and ridges by sanding or grinding.
- F. Waterproofing: Install to produce a waterproof membrane of uniform thickness that is securely bonded to substrate.
  - 1. Do not install tile over waterproofing until waterproofing has cured and has passed testing to determine that it is watertight.
- G. Metal Lath: Install and scratch coat to walls to comply with ANSI A108.1A, Section 4.1.
- H. Cementitious Backer Units: Install at showers, tubs, and where indicated, and treat joints to comply with ANSI A108.11.
- I. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile, unless otherwise indicated.
- J. Field-Applied Temporary Protective Tile Coating: Apply a continuous film to protect tile surfaces from adhesion of grout.
- K. Back Buttering: Produce 100 percent mortar coverage on tile backs to comply with applicable special requirements for back buttering in ANSI A108 Series tile installation standards in the following locations:

1. Exterior floors.
  2. Floors in wet areas, including showers, tub enclosures, laundries, and swimming pools.
  3. Floors installed with chemical-resistant mortars and grouts.
  4. Floors composed of 8-by-8-inch (203-by-203-mm) tile or larger.
  5. Floors composed of rib-backed tiles.
  6. Exterior wall installations.
  7. Wall installations in wet areas, including showers, tub enclosures, laundries, and swimming pools.
  8. Wall installations composed of 8-by-8-inch (203-by-203-mm) tile or larger.
- L. Blending: For tile with color variations, install blended tiles to produce color variations that match approved Samples.
- M. Extend tile work into recesses and under or behind equipment and fixtures to produce a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- N. Accurately form intersections and returns. Cut and drill tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items to produce straight aligned joints. Fit tile to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- O. Jointing Pattern: Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths.
1. Lay tile in grid pattern or pattern indicated.
- P. Joint Widths: Produce uniform joint widths as follows:
1. Floor Tile:
    - a. Ceramic Mosaic Tile: 1/16 inch (1.6 mm)
    - b. Quarry Tile: 1/4 inch (6.35 mm) or 3/8 inch (9.5 mm).
  2. Wall Tile: 1/16 inch (1.6 mm).
- Q. Wainscots: Lay out tile wainscots to next full tile beyond dimensions indicated.
- R. Expansion Joints: Form expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Locate joints in tile surfaces directly above joints in concrete substrates.
  2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."

- S. Grout: Install to comply with ANSI A108.10, unless otherwise indicated.
  - 1. Chemical-Resistant Epoxy Grouts: Comply with ANSI A108.6.
  - 2. Chemical-Resistant Furan Grouts: Comply with ANSI A108.8.
- T. Stone Thresholds: Install stone thresholds set in same type of setting bed as abutting field tile, unless otherwise indicated.
  - 1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.
- U. Cleaning: After grouting, clean ceramic tile surfaces so they are free of grout and foreign matter.
  - 1. Temporary Protective Coating: Remove by method recommended by coating manufacturer that is acceptable to tile and grout manufacturers. Trap and remove coating to prevent it from clogging drains.

### 3.2 FLOOR TILE INSTALLATION

- A. Exterior Installation Method: Mortar bed bonded to concrete slab.
  - 1. TCA Designation: F101 (cement mortar bed bonded to concrete slab) or F102 (thin-set mortar bonded to concrete slab).
- B. Interior Installation Method: Thickset over cleavage membrane.
  - 1. TCA Designation: F111 (cement mortar bed with cleavage membrane, over concrete subfloor) or F114 (cement mortar bed with cleavage membrane and epoxy or furan grout, over concrete subfloor) or F141 (cement mortar bed with cleavage membrane over wood subfloor).
- C. Interior Installation Method: Bonded to waterproof or crack-suppression membrane.
  - 1. TCA Designation: F121 (cement mortar bed bonded to waterproof membrane over concrete or wood subfloor) or F122 (thin-set mortar bonded to waterproof membrane over concrete slab).
- D. Interior Installation Method: Bonded to subfloor with mortar.
  - 1. TCA Designation: F112 (cement mortar bed bonded to concrete subfloor) or F113 (thin-set mortar bonded to concrete subfloor) or F115 (thin-set mortar bonded to concrete subfloor, with epoxy or furan grout) or F144 (thin-set mortar bonded to cementitious backer units over wood subfloor, with epoxy or furan grout).
- E. Interior Installation Method: Bonded to subfloor with adhesive.

1. TCA Designation: F116 (organic adhesive or epoxy adhesive over concrete subfloor) or F142 (organic adhesive over wood subfloor) or F143 (epoxy mortar over wood subfloor).
- F. Interior Installation Method: Set and grouted with chemical-resistant materials over concrete subfloor.
1. TCA Designation: F131 (epoxy mortar bonded to concrete subfloor, with epoxy grout) or F132 and F112 (epoxy mortar bonded to cured cement mortar bed over concrete subfloor, with epoxy grout) or F132 and F111 (epoxy mortar bonded to cured cement mortar bed with cleavage membrane over concrete subfloor and with epoxy grout) or F133 (furan mortar bonded to concrete subfloor, with furan grout).

### 3.3 WALL TILE INSTALLATION

- A. Interior Installation Method: Thickset mortar bed over studs.
1. TCA Designation: W231 (cement mortar bed over wood studs or furring) B411 (bathtub walls: cement mortar bed over wood studs) B411 and W241 (bathtub walls: cement mortar bed over metal studs) W241 (cement mortar bed over metal studs).
- B. Interior Installation Method: Thin-set mortar bonded to solid-panel substrate.
1. TCA Designation: W243 (thin-set mortar bonded to gypsum board on studs) W244 (thin-set mortar bonded to cementitious backer units on studs) B413 (bathtub walls: thin-set mortar bonded to water-resistant gypsum board on studs) B412 (bathtub walls: thin-set mortar bonded to cementitious backer units on studs).
- C. Interior Installation Method: Bonded to solid-panel substrate with organic adhesive.
1. TCA Designation: W223 (organic adhesive over solid backing) W242 (organic adhesive over gypsum board on metal studs).
- D. Interior Installation Method: Mortar bed for shower.
1. TCA Designation: B414 and W221 (shower receptor with cement mortar bed over solid backing on walls) B414 and W231 (shower receptor with cement mortar bed over wood studs on walls) B414 and W241 (shower receptor with cement mortar bed over metal studs on walls) B415 and W244 (shower receptor with thin-set mortar bonded to cementitious backer units over wood or metal studs on walls).

END OF SECTION 09310